

**REMARKS**

**I. Overview**

These remarks are set forth in response to the Non-Final Office Action mailed April 6, 2007. As this amendment has been timely filed within the three-month statutory period, neither an extension of time nor a fee is required. Presently, claims 1 through 20 are pending in the Patent Application. Claims 1, 10 and 19 are independent in nature. In the Non-Final Office Action, claims 1-29 have been rejected on cited art. Specifically, claims 1, 4-6, 10, 13-15 and 19 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Ignasi Esquerra et al., Design of a Phonetic Corpus for Speech Recognition in Catalan, Universitat Politècnica de Catalunya (Barcelona, Spain 1998), hereinafter "Esquerra". Further, claims 2-3, 7-9, 11-12, 16-18 and 20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Esquerra in view of U.S. Patent No. 5,794,189 to Gould.

**II. The Applicant's Invention**

The Applicant has invented a system, method and apparatus for a phonetic coverage interactive tool for developing a script to be used with speech recognition systems. A script development tool is a software or computing application which is operated by a user or developer. The tool incorporates a language model for the particular language to be used with the speech recognition application for which the script is to be used. Included in the language model is a particular speech products vocabulary which defines the set of speech products, or words, that the language model uses, and that the tool will recognize.

In operation, the tool receives a starting script as an input and analyzes the words and phonemes in the script, given the particular language model and the speech products vocabulary. It thereafter produces a set of statistical results as an output, which mainly include statistics as to the particular phonetics of the starting script. These "phonetic statistics" may include data as to the number of times each phoneme, as defined by the language model, occurs in the script, or data as to which phonemes do not appear at all in the script. The user will then inspect the results, on any device which is capable of reproducing the results in a perceptible form, and decide whether any changes need to be made in the script.

If the script is lacking in certain phonemes, the user may then enter a word containing the missing phonemes into the script development tool, which updates the script, and reanalyzes the script to produce a new set of statistics. These statistics can thereafter be reanalyzed for phoneme coverage, and so forth. In addition to adding words to the script, the user may also remove words, if the phoneme coverage is not as uniform as desired. In this way, the tool can be used to take a given script and correct the phoneme coverage for the script, for any given language. Additionally, the tool greatly reduces the amount of time required to develop such a script, and gives developers an instant picture of the phonetic statistics of any script, as it is developed.

### III. Rejections Under 35 U.S.C. §§ 102(b) and 103(a)

#### A. Characterization of the Cited Art

##### 1. Esquerria

Esquerria discloses the design of a corpus for speech recognition to be used for the recording of a speech database in the Catalan language. A previous database in Spanish was the reference in setting the specifications about the characteristics of the sentences and in the

minimum number of units required. An analysis of unit frequencies were carried out in order to know which units were relevant for training and to compare the results with the figures from the designed corpus. Three different sub-corpora were generated, one for training, the other for vocabulary-independent verification and the third for vocabulary-dependent verification. Short sentences were obtained that contained all phones and relevant diphones in a sufficient quantity. Evaluation of the corpus characteristics was performed using several parameters to validate database specifications. Using this corpus, a speech database was recorded over a telephone line and manually labeled, and used to train and test speech recognition systems.

## 2. Gould

Gould teaches a method for use in recognizing speech in which signals are accepted corresponding to interspersed speech elements including text elements corresponding to text to be recognized and command elements to be executed. The elements in Gould are recognized and modification procedures are executed in response to recognized predetermined ones of the command elements. The modification procedures in turn include refraining from training speech models when the modification procedures do not correct a speech recognition error. Optionally, the modification procedures include simultaneously modifying previously recognized ones of the text elements.

## B. Traversal of the Rejections on the Art

Applicant's originally filed independent claims require the counting of each phoneme in script data to produce a count data for phonemes in language phoneme data. The independent claims further require the generation of a set of statistical data derived from the count data.

Specifically, the set of statistical data as claimed includes one or more metrics of the extent to which the phonemes in the language phoneme data are included in the script data.

Exemplary claim 1 recites as follows:

1. A method for developing a script to be used with speech recognition systems, said method comprising the steps of:
  - reading language phoneme data for a given language, the language phoneme data having a plurality of phonemes occurring in the given language;
  - reading script data having a set of one or more phonemes;
  - counting each phoneme in the script data to produce a count data for each of the plurality of phonemes in the language phoneme data;
  - generating a set of statistical data derived from the count data, the set of statistical data including one or more metrics of the extent to which the phonemes in the language phoneme data are included in the script data.

Thus, as originally filed, claim 1 (and through similar language, claims 10 and 19) require the counting of "phonemes" in script data and the determination of the extent to which phonemes in language phoneme data appear in the script data.

In contrast, the Conclusion of Esquerre clearly provides that "units" are not phonemes, but phones including allophones and diphones. The text of the relevant portion of section 5, the Conclusion of Esquerre is reproduced for the convenience of the Examiner as follows, "As a first step, a text corpus was transcribed and segmented to count the number of occurrences for each type of unit (phones, allophones and diphones)." In fact, Merriam-Webster defines phoneme as:

"any of the abstract units of the phonetic system of a language that correspond to a set of similar speech sounds (as the velar 'k' of cool and the palatal 'k' of keel) which are perceived to be a single distinctive sound in the language"

By comparison, Merriam Webster defines "phone" in the linguistic context as

a speech sound considered as a physical event without regard to its place in the sound system of a language

Of note, Wikipedia notes that a phoneme is "a set of phones that are cognitively equivalent (the "same" sound or element of sign)". Thus, the term phone and phoneme are not synonymous and the application of the term "unit" in Esquerra (which has been equated by Esquerra to a phone) cannot be held to be the equivalent of a "phoneme" as noted in paragraphs 5, 9 and 13 of the Office Action.

IV. Conclusion

The Applicants respectfully request the withdrawal of the rejections under 35 U.S.C. §§ 102(b) and 103(a) owing to the clearly distinctive nature of a "phone" as compared to a "phoneme" and the foregoing remarks. The Applicants request that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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/Steven M. Greenberg/

Steven M. Greenberg, Reg. No.: 44,725  
Attorney for Applicant(s)  
Carey, Rodriguez, Greenberg & Paul, LLP  
950 Peninsula Corporate Circle, Suite 3020  
Boca Raton, Florida 33487  
**Customer No. 46322**  
Tel: (561) 922-3845  
Fax: (561) 244-1062